We claim:

1. A method of determining an optimal threshold value (t_o) for an image, said method comprising the steps of:

a) obtaining an image;

b) selecting a test segment of said image;

c) determining the mean feature size (S) of features appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce mean feature size data (S(t));

d) selecting a subset of the mean feature size data gathered in step c); and

e) determining an optimal threshold value (t_o) as a function of said subset of mean feature size data.

2. The method according to claim 1, wherein, in step e), said function of said subset of mean feature size data results in an optimal threshold value (t_o) equal to or approximating a midpoint of said subset of mean feature size data.

3. The method according to claim 1, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

4. The method according to claim 1, wherein, in step d), said subset of the mean feature size data contains less than all of the mean feature size data.

5. The method according to claim 1, wherein, in step d), said subset of the mean feature size data contains all of the mean feature size data except values for which S(t) is greater than 1% of the maximum value of S observed in the mean feature size data (S_{max}).

6. The method according to claim 1, additionally comprising the steps of:

f) counting the number of features (N) appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce counting data (N(t));

g) selecting a subset of the mean feature size data (S(t)) as a function of said counting data (N(t)).

7. The method according to claim 1, additionally comprising the steps of :

f) counting the number of features (N) appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce counting data (N(t));

h) determining a cutoff threshold value (t_c) as a function of said counting data (N(t)); and

i) selecting a subset of the mean feature size data (S(t)) as a function of the cutoff threshold value (t_c).

8. The method according to claim 7, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t \geq t_c$.

9. The method according to claim 7, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t > t_c$.

10. The method according to claim 7 wherein said cutoff threshold value (t_c) is determined as a function of said counting data (N(t)), wherein said function chooses a cutoff threshold value (t_c) that falls in a transition range between an early noise peak of said counting data (N(t)) and a following low-slope region.

11. The method according to claim 7 wherein said cutoff threshold value (t_c) is determined by a function $t_c = t_{P\%}$ wherein $t_{P\%}$ is the highest value of t for which N(t) has not exceeded P% of the maximum value of N observed in the counting data (N_{max}), wherein P% is selected from numbers between 1% and 100%.

12. The method according to claim 11 wherein P% is selected from numbers between 50% and 95%.

13. The method according to claim 7 wherein said cutoff threshold value (t_c) is determined by a function $t_c = 2t_{P\%} - t_{Q\%}$; wherein $t_{P\%}$ is the lowest value of t for which N(t) has not exceeded P% of the maximum value of N observed in the counting data (N_{max}), wherein $t_{Q\%}$ is the lowest value of t for which N(t) has not exceeded Q% of the maximum value of N observed in the counting data (N_{max}), wherein P% ≥ Q%, wherein P% and Q% are independently selected from numbers between 1% and 100%.

14. The method according to claim 11 wherein P% is selected from numbers between 50% and 95% and wherein Q% is selected from numbers between 5% and 95%.

15. The method according to claim 11 wherein P% = 95% and Q% = 50%.

16. The method according to claim 13, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t \geq t_c$.

17. The method according to claim 13, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t > t_c$.

18. The method according to claim 7, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

19. The method according to claim 7, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

20. The method according to claim 9, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

21. The method according to claim 9, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

22. The method according to claim 13, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

23. The method according to claim 13, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

24. The method according to claim 17, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

25. The method according to claim 17, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

26. A method of thresholding an image comprising the method of claim 1, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

27. A method of thresholding an image comprising the method of claim 7, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

28. A method of thresholding an image comprising the method of claim 9, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

29. A method of thresholding an image comprising the method of claim 13, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

30. A method of thresholding an image comprising the method of claim 17, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

31. A method of thresholding an image comprising the method of claim 21, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

32. A method of thresholding an image comprising the method of claim 25, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

33. A system for determining an optimal threshold value (t_o) for an image comprising:

i) an image device for providing a digitized image;

ii) a data storage device; and

iii) a central processing unit for receiving the digitized image from the image device and which can write to and read from the data storage device, the central processing unit being programmed to:

a) obtain an image;

b) select a test segment of said image;

c) determine the mean feature size (S) of features appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce mean feature size data (S(t));

d) select a subset of the mean feature size data gathered in step c); and

e) determine an optimal threshold value (t_o) as a function of said subset of mean feature size data.

34. The system according to claim 33, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

35. The system according to claim 33, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

36. The system according to claim 33, wherein, in step d), said subset of the mean feature size data contains less than all of the mean feature size data.

37. The system according to claim 33, wherein, in step d), said subset of the mean feature size data contains all of the mean feature size data except values for which S(t) is greater than 1% of the maximum value of S observed in the mean feature size data (S_{max}).

38. The system according to claim 33, wherein said central processing unit is additionally programmed to:

f) count the number of features (N) appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce counting data (N(t));

g) select a subset of the mean feature size data (S(t)) as a function of said counting data (N(t)).

39. The system according to claim 33, wherein said central processing unit is additionally programmed to:

f) count the number of features (N) appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce counting data (N(t));

h) determine a cutoff threshold value (t_c) as a function of said counting data (N(t)); and

i) select a subset of the mean feature size data (S(t)) as a function of the cutoff threshold value (t_c).

40. The system according to claim 39, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t \geq t_c$.

41. The system according to claim 39, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t > t_c$.

42. The system according to claim 39 wherein said cutoff threshold value (t_c) is determined as a function of said counting data (N(t)), wherein said function chooses a cutoff threshold value (t_c) that falls in a transition range between an early noise peak of said counting data (N(t)) and a following low-slope region.

43. The system according to claim 39 wherein said cutoff threshold value (t_c) is determined by a function $t_c = t_{P\%}$ wherein $t_{P\%}$ is the highest value of t for which N(t) has

not exceeded P% of the maximum value of N observed in the counting data (N_{max}), wherein P% is selected from numbers between 1% and 100%.

44. The system according to claim 43 wherein P% is selected from numbers between 50% and 95%.

45. The system according to claim 39 wherein said cutoff threshold value (t_c) is determined by a function $t_c = 2t_{P\%} - t_{Q\%}$; wherein $t_{P\%}$ is the lowest value of t for which N(t) has not exceeded P% of the maximum value of N observed in the counting data (N_{max}), wherein $t_{Q\%}$ is the lowest value of t for which N(t) has not exceeded Q% of the maximum value of N observed in the counting data (N_{max}), wherein P% $\geq$ Q%, wherein P% and Q% are independently selected from numbers between 1% and 100%.

46. The system according to claim 43 wherein P% is selected from numbers between 50% and 95% and wherein Q% is selected from numbers between 5% and 95%.

47. The system according to claim 43 wherein P% = 95% and Q% = 50%.

48. The system according to claim 45, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t \geq t_c$.

49. The system according to claim 45, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t > t_c$.

50. The system according to claim 39, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

51. The system according to claim 39, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

52. The system according to claim 41, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

53. The system according to claim 41, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

54. The system according to claim 45, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

55. The system according to claim 45, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

56. The system according to claim 49, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

57. The system according to claim 49, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

58. A system of thresholding an image comprising the method of claim 33, wherein said central processing unit is additionally programmed to:

j) obtain a binary image by thresholding said image by use of said optimal threshold value (t_o).

59. A system of thresholding an image comprising the method of claim 39, wherein said central processing unit is additionally programmed to:

j) obtain a binary image by thresholding said image by use of said optimal threshold value (t_o).

60. A system of thresholding an image comprising the method of claim 41, wherein said central processing unit is additionally programmed to:

j) obtain a binary image by thresholding said image by use of said optimal threshold value (t_o).

61. A system of thresholding an image comprising the method of claim 45, wherein said central processing unit is additionally programmed to:

j) obtain a binary image by thresholding said image by use of said optimal threshold value (t_o).

62. A system of thresholding an image comprising the method of claim 49, wherein said central processing unit is additionally programmed to:

j) obtain a binary image by thresholding said image by use of said optimal threshold value (t_o).

63. A system of thresholding an image comprising the method of claim 53, wherein said central processing unit is additionally programmed to:

j) obtain a binary image by thresholding said image by use of said optimal threshold value (t_o).

64. A method of thresholding an image comprising the method of claim 57, wherein said central processing unit is additionally programmed to:

j) obtain a binary image by thresholding said image by use of said optimal threshold value (t_o).

65. Data storage media having recorded thereon software that upon installation in a computer and execution of the software will cause the computer to carry out a method of determining an optimal threshold value (t_o) for an image, said method comprising the steps of:

a) obtaining an image;

b) selecting a test segment of said image;

c) determining the mean feature size (S) of features appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce mean feature size data (S(t));

d) selecting a subset of the mean feature size data gathered in step c); and

e) determining an optimal threshold value (t_o) as a function of said subset of mean feature size data.

66. The data storage media of claim 65, wherein, in step e), said function of said subset of mean feature size data results in an optimal threshold value (t_o) equal to or approximating a midpoint of said subset of mean feature size data.

67. The data storage media of claim 65, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

68. The data storage media of claim 65, wherein, in step d), said subset of the mean feature size data contains less than all of the mean feature size data.

69. The data storage media of claim 65, wherein, in step d), said subset of the mean feature size data contains all of the mean feature size data except values for which S(t) is greater than 1% of the maximum value of S observed in the mean feature size data (S_{max}).

70. The data storage media of claim 65, wherein said method additionally comprises the steps of:

f) counting the number of features (N) appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce counting data (N(t));

g) selecting a subset of the mean feature size data (S(t)) as a function of said counting data (N(t)).

71. The data storage media of claim 65, wherein said method additionally comprises the steps of :

f) counting the number of features (N) appearing in said test segment of said image at each of a plurality of threshold values (t), so as to produce counting data (N(t));

h) determining a cutoff threshold value (t_c) as a function of said counting data (N(t)); and

i) selecting a subset of the mean feature size data (S(t)) as a function of the cutoff threshold value (t_c).

72. The data storage media of claim 71, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t \geq t_c$.

73. The data storage media of claim 71, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t > t_c$.

74. The data storage media of claim 71 wherein said cutoff threshold value (t_c) is determined as a function of said counting data (N(t)), wherein said function chooses a cutoff threshold value (t_c) that falls in a transition range between an early noise peak of said counting data (N(t)) and a following low-slope region.

75. The data storage media of claim 71 wherein said cutoff threshold value (t_c) is determined by a function $t_c = t_{P\%}$ wherein $t_{P\%}$ is the highest value of t for which N(t) has not exceeded P% of the maximum value of N observed in the counting data (N_{max}), wherein P% is selected from numbers between 1% and 100%.

76. The data storage media of claim 75 wherein P% is selected from numbers between 50% and 95%.

77. The data storage media of claim 71 wherein said cutoff threshold value (t_c) is determined by a function $t_c = 2t_{P\%} - t_{Q\%}$; wherein $t_{P\%}$ is the lowest value of t for which N(t) has not exceeded P% of the maximum value of N observed in the counting data (N_{max}), wherein $t_{Q\%}$ is the lowest value of t for which N(t) has not exceeded Q% of the maximum value of N observed in the counting data (N_{max}), wherein P% ≥ Q%, wherein P% and Q% are independently selected from numbers between 1% and 100%.

78. The data storage media of claim 75 wherein P% is selected from numbers between 50% and 95% and wherein Q% is selected from numbers between 5% and 95%.

79. The data storage media of claim 75 wherein P% = 95% and Q% = 50%.

80. The data storage media of claim 77, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t \geq t_c$.

81. The data storage media of claim 77, wherein said subset of the mean feature size data (S(t)) is selected by including all values for which $t > t_c$.

82. The data storage media of claim 71, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

83. The data storage media of claim 71, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

84. The data storage media of claim 73, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

85. The data storage media of claim 73, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

86. The data storage media of claim 77, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

87. The data storage media of claim 77, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

88. The data storage media of claim 81, wherein, in step e), said function of said subset of mean feature size data yields a result equal to or approximating a midpoint of said subset of mean feature size data.

89. The data storage media of claim 81, wherein, in step e), said optimal threshold value (t_o) is taken as the weighted average threshold value (t) appearing in said subset of mean feature size data, weighted according to mean feature size (S(t)).

90. The data storage media of claim 65, wherein said method additionally comprises the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

91. The data storage media of claim 71, wherein said method additionally comprises the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

92. The data storage media of claim 73, wherein said method additionally comprises the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

93. The data storage media of claim 77, wherein said method additionally comprises the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

94. The data storage media of claim 81, wherein said method additionally comprises the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

95. The data storage media of claim 85, wherein said method additionally comprises the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).

96. The data storage media of claim 89, wherein said method additionally comprises the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (t_o).